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Social network predictors of disclosure of MSM behavior and HIV-positive serostatus among African American MSM in Baltimore, Maryland

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Abstract

This study examined correlates of disclosure of MSM behavior and seropositive HIV status to social network members among 187 African American MSM in Baltimore, MD. 49.7% of participants were HIV-positive, 64% of their social network members (excluding male sex partners) were aware of their MSM behavior, and 71.3% were aware of their HIV-positive status. Disclosure of MSM behavior to network members was more frequent among participants who were younger, had a higher level of education, and were HIV-positive. Attributes of the social network members associated with MSM disclosure included the network member being HIV-positive, providing emotional support, socializing with the participant, and not being a female sex partner. Participants who were younger were more likely to disclose their positive HIV status. Attributes of social network members associated with disclosure of positive serostatus included the network member being older, HIV-positive, providing emotional support, loaning money, and not being a male sex partner.

Introduction

Although African American men who have sex with men (MSM) have exceedingly high rates of HIV[1], few studies have examined their disclosure of same-sex sexual behavior (MSM disclosure) or disclosure of their HIV-positive serostatus (HIV disclosure). Disclosure of either can be complex processes. Disclosure may be overt or implied, direct or discovered through intermediaries, and intentional or accidental. Benefits to disclosure may include increased social support and access to health services [2-5]. Yet, disclosure of positive serostatus and same-sex behavior does not necessarily lead to positive outcomes. It may lead to stigmatized identity, fear, isolation, and interpersonal violence [6,7].

MSM Disclosure

Several researchers have noted that social and cultural factors may impede African American men from specifically disclosing same-sex behaviors and identities [8,9]. In a study of African American and white men who have sex with men and women (MSMW), white MSMW were more likely than African American MSMW to disclose their same-sex behavior to female partners [10]. Kennamer [11] reported that Black MSM were less likely than white MSM to disclose their same-sex behavior to family members, co-workers, and heterosexual friends. In a qualitative study of 38 African American MSMW, Malebranche and colleagues [12]found that disclosure of same-sex behavior was not linked to condom use among MSM who also had sex with women.

One study of predominately white MSM and women who have sex with women did utilize a social network approach to examine disclosure of sexual orientation [13]. Their data indicated that study participants tended to have better relationships with social network members who were directly told about their sexual orientation as compared to social network members who indirectly found out their sexual orientation. Although this study demonstrated the value of using a social network approach, only 5% of the sample was African American, and the social network inventory utilized a social role approach, such as mother, father, and co-worker, to measure social network membership. However, social roles may not capture important support functions, such as caregiving by friends, provided by social network members who do not occupy traditional social roles.

HIV serostatus disclosure

Most of the theories of disclosure focus on the process and motivation for disclosure and the outcomes of disclosure [14,15]. More recent theories also focus on the mediating processes [16]. Many of these theories assume that disclosure is a voluntary and explicit process based on perceptions of costs and benefits. Few take into consideration the economic and cultural factors that may be involved in disclosure [17]. For example, financial dependency may influence not only the risk of disclosing, but also one's ability to maintain privacy and choose whether or not to disclose. Cultural attitudes toward HIV and routes of infection may also be key determinates of disclosure. Moreover social norms about privacy and medical care may influence both who is informed and what information is provided. A range of MSM studies have examined disclosure of HIV-positive status to sexual partners. A high level of disclosure to primary sexual partners has been documented [5]. Illness status, such as low CD4 count and AIDS diagnosis, has also been found to be associated with disclosure [18]. In a social network study of women who were predominately Latina and African American, Rice and colleagues [19] found that HIV-positive women were significantly more likely to disclose their serostatus to HIV-positive network members and network members who were sexual partners. Zea and colleagues [20] found that among Latino men, disclosure of HIV-positive status was associated with disclosure of MSM behavior. In a multisite study, Simon Rosser and colleagues [21] reported lower levels of serodisclosure to secondary sexual partners among African Americans as compared to whites. In an analyses of ethnic differences of serodisclosure among MSM, Wei and colleagues [22] found African American men reporting lower levels of confidence in partners' reports of HIV-negative status, as compared to other ethnicity groups. A qualitative study of 30 African American MSM and MSMW examined themes of condom use, sexual activity and HIV disclosure [23]. Most participants reported selective disclosure of HIV-positive status. However, some participants reported disclosing to all partners and others reported not disclosing their status to anyone.

As social network analysis provides detailed information on individuals' sexual relationships and sources of social support, it is a potentially valuable method of studying disclosure. Identifying characteristics of the social network members to whom African American MSM disclose their same-sex behaviors or serostatus can inform interventions that address and benefit from disclosures, such as social support mobilization for HIV care and medication adherence. The current study examined correlates of disclosure of MSM behavior and seropositive HIV status to social network members. We hypothesized that participants would be less likely to disclose same-sex behaviors to female sexual partners as compared to others and that, as there is a generational difference in attitudes towards MSM, younger MSM would be more likely to disclose their MSM status. Moreover, we anticipated that participants would be less likely to disclose HIV status to sexual partners as compared to other network members, regardless of gender. We assessed attributes of both the individual

and their reports about the attributes of their social network members that were associated with disclosure to those social network members.

Methods

Data for the current study were from a cohort of African American MSM recruited for a pilot HIV risk-reduction intervention that was conducted in Baltimore, Maryland. Participants were recruited through the Internet (websites and chatrooms for African American MSM), street and venue-based outreach, and advertisements in the local papers. Participants were screened in a community-based research clinic using audio computer-assisted self-interview (ACASI) methods. There were seven inclusion criteria: (1) 18 years old or older, (2) identify as a male, (3) self-report black or African American race/ethnicity, (4) report having >=2 sex partners in the prior 3 months (at least one of which must have been male), (5) report unprotected anal sex with a male in prior 3 months, (6) willingness to take an HIV test if negative or unknown status, or to provide documentation of HIV-positive status, and (7) willingness to identify social network members and recruit them into the study. Eligible participants (referred to herein as Index participants) completed a baseline survey using ACASI and a social network inventory. There were 959 men screened for the study, of whom, 46% were screened ineligible.

Participants were paid $40 for the baseline assessment visit. All protocols were approved by the Institutional Review Board at the Johns Hopkins Bloomberg School of Public Health and the Centers for Disease Control and Prevention.

Measures

Index Participant Characteristics

Index participants reported their age, highest level of education completed, income, current employment status, and HIV serostatus. Index participants who self-reported negative or unknown serostatus were tested for antibodies using an Oraquick rapid HIV antibody test. Preliminary-positive tests were confirmed using Western blot assays of serum specimens. HIV seropositivity was defined as positive by confirmatory tests or the provision of documents indicating that participants were HIV-positive.

Social network inventory

The personal network inventory entailed 14 name generator questions that were used to delineate social and sexual network members with whom they interacted in the prior three months. Specifically, Index participants were asked about social network members who provide emotional, material and financial support; socialized with, had sex, used drugs or alcohol, and experienced conflict in the past 3 months. The name generator question that assessed trust of network member asked the Index “During the last 3 months, who did you entrust with your money, to get groceries, pay your bills or run errands for you?” Whereas the name generator that asked “During the last 3 months, who loaned or gave you some money?” assessed the loaning of money, and “During the last 3 months, who did you get together to hang out with or socialize?” assessed which network members the Index participants socialized with. The emotional support name generator stated, “During the last 3 months, who[m] did you talk to about things that were personal and private or who did you get advice from?” and for material support “During the last 3 months, who pitched in to help you do things that you needed some help with such as running errands, giving you a ride?” The network inventory also asked Index participants to list their sex partners from the last three months.

After the names of personal network members were listed, a set of questions assessed the attributes of each of the network members, including age; gender; HIV status; distance that the Index lived from the network members (outside the neighborhood, same neighborhood [within five blocks], same household); frequency of contact (dichotomized into “weekly” and “less than weekly”); level of trust (on a scale from 1 to 10, with 10 as high trust, dichotomized into “10” or “less than 10”); discussed HIV/STD prevention in the prior 3 months (yes, no); and relationship with network member (categorized into “female non-sex partner”, “female sex partner”, “male non-sex partner”, “male sex partner”, “transgender non-sex partner”, and “transgender sex partner”). Conflictual ties were assessed with the question, “Who would you say [on this list] you are often not on good terms with? By this I mean that you might disagree with, or argue or fight with this person.”

Outcome variables

HIV serostatus disclosure—This variable was assessed by asking HIV-positive Index participants: “Who on this list [network inventory] have you disclosed your HIV status to?” and “Of those who you have not told, who would you like to disclose to?”

MSM disclosure and reactions to MSM disclosure—This variable was assessed by asking Index participants: “Who on this list knows that you have had sex with men?” Participants were also asked: “Of the people you just named, who doesn't treat you well because they know that you have sex with men?”

Data analysis

Frequency distributions were calculated for the covariates. An interaction term between network members' gender and sexual relationship was created to distinguish between sexual and non-sexual network members. Given the limited number of transgender network members (n=38, 2.3%), they were excluded from the final analysis (N=1,602). In the MSM disclosure analysis, network members who were male sex partners were also excluded, and therefore a total 1,110 network members were included (figure 1).

Logistic regression models with generalized estimating equations (GEE) using network membessr as the unit of analysis were conducted to assess the associations between Index participants and the attributes of their egocentric social network members, and the outcomes of MSM disclosure and HIV-seropositive disclosure [24]. Social network variables that were associated with outcomes in the bivariate models ($p<0.20$) were entered into a multivariate model that used backward stepwise selection ($p<0.10$). A p.<.20 criteria was used as the inclusion criteria to ensure that potential confounders were not excluded from the analyses. Variance inflation factor (VIF) was checked to determine the potential multicollinearity among the independent variables [25]. The VIF among the independent variables in the multivariate logistic regression models ranged from 1.03 to 1.74, indicating there was no multicollinearity among the independent variables. GEE were used to account for the fact that individuals had multiple network partners that contributed to the analysis. For example, if the participant listed 10 network members, each of these network members was treated as an observation within a cluster of ten. Robust standard errors were used for estimation of the 95% confidence intervals. All analyses were performed using Stata Version 10.0.

Results

The analyses for this study included 187 self-identified African American males who reported having unprotected anal sex with a male partner in the past 3 months. These 187 Index participants reported a total of 1,602 social network members, and nominated an average of 9 social network members. Table 1 presents sample characteristics of the187

Index participants. The average age of the Index participants was 38, with a range from 18 to 59. Over half of the sample self-identified as homosexual, gay or same gender-loving, and one third self identified as bisexual. For over half (58%), the highest education level was less than college, associates, or technical degree; 73% were not working or on disability; and over half (54%) had an income of less than $10,000. Initially, two-fifths (42%) self-reported being HIV-positive, but in total 50% were confirmed as HIV positive through documentation of positive test results or through HIV testing. Fifteen HIV-positive cases were newly identified. Table 2 presents the results of GEE logistic regression with the outcomes of MSM status disclosure and HIV-positive status disclosure.

MSM Disclosure

Overall, participants reported that most (76% of 1,602) of their network members were aware of their MSM behaviors. Among the 1,110 network members who were not male sex partners, 64% (N=710) knew the participant had sex with other men. Restricting the analyses to these 1,110 network members, only 8% of the Index participants reported that none of their network members knew that they had sex with men, 16% reported that less than half of their network members knew that the participant had sex with men, 24% stated that over half of their network members knew that they had sex with men, and 52% reported that all of their network members knew that they had sex with men (Figures 1 & 2). Participants reported that only 14 (2%) of the 710 network members who were aware of their MSM activity treated them poorly because of their same-sex behavior.

In the bivariate analysis of MSM disclosure (Table 2), participants who were more highly educated (Odds ratio [OR]: 2.43), and HIV-positive (OR: 2.84) were more likely to disclose their MSM behavior to their network members; whereas older age was negatively associated with disclosure (OR: 0.50). Characteristics of network members that were positively associated with MSM disclosure to that specific network member included the network member being HIV-positive (OR: 2.14), providing emotional support (OR: 2.18), providing material support (OR: 1.49), socializing with Index participant (OR: 2.03), and talking about HIV/STD prevention (OR: 2.20). Being a female sex partner (OR: 0.14) and living in the same household (OR: 0.64), were negatively associated with MSM disclosure.

In multivariate analysis, Index participant characteristics that were independently associated with MSM disclosure (Table 2) included participants' age, with younger participants more likely to disclose (Adjusted Odds Ratio [AOR]: 0.39), level of education (AOR: 2.38), and HIV-positive status (AOR: 4.67). In the same model, social network member characteristics that were positively associated with MSM disclosure to that network member included the network member being HIV-positive (AOR: 2.05), providing emotional support (AOR: 2.17), and socializing with Index participant (AOR: 1.71). Being a female sex partner was negatively associated with MSM disclosure to that network member (AOR: 0.19).

HIV Seropositive Disclosure

Of the 78 participants who self-reported their HIV status as positive, the majority stated that their network members (453 out of 635 or 71%) were aware of their HIV status (Figure 3). Out of the 182 network members to whom the participants had not disclosed their HIV status, there were only 30 network members (17%) to whom the participants reported that they wanted to disclose their HIV status.

In the bivariate analysis of HIV disclosure to the network members, disclosure was more likely to occur if the network member was older (OR: 1.49), HIV-positive (OR: 3.97), provided emotional support (OR: 3.60), provided material support (OR: 3.00), loaned participant money (OR: 2.23), was entrusted by participant with money (OR: 5.15),

socialized (OR: 2.08), had a high level of general trust (OR: 2.86), had a conflictual relationship (OR: 2.23), and reported conversation about HIV/STD prevention with Index(OR: 3.45). If the network member was a male sex partner, the Index reported that he was significantly less likely to disclose his HIV status to that network member (OR: 0.33), (Table 2). In a multivariate analysis of HIV disclosure (Table 2), the Index's age was associated with serostatus disclosure, with older participants significantly less likely to disclose (AOR: 0.60). Attributes of social network members associated with disclosure of serostatus to that network member include the network members being older (AOR: 1.42), providing emotional support (AOR: 1.90), loaning participant money (AOR: 2.89) and being HIV-positive (AOR: 6.39). Being a male sex partner was negatively associated with HIV serostatus disclosure (AOR: 0.32).

Discussion

The study findings suggest that MSM disclosure and HIV status disclosure are associated with the characteristics of the individual disclosing and the characteristics of their network, the recipients of the disclosure. Several statistically significant associations for these two domains of disclosure were similar, including Index participants' younger age, network members' HIV status, and provision of emotional support by the network member. The Index's education level was more strongly associated with MSM disclosure than with HIV disclosure. There was a negative association between the Index's age and both types of disclosure, with younger Indexes reporting greater disclosure to network members. This finding of the association with age and disclosure fits with a secular trend of greater acceptance among younger generations of same-sex behaviors [26] and suggests the need for support and tailored programs for older African American MSM who may feel greater levels of stigma and discrimination for MSM behavior and HIV infection. As hypothesized, participants were much less likely to disclose their MSM behavior to female network members who were sex partners as compared to other female network members, which suggests a need for tailoring prevention interventions to the unique needs of African American MSMW.

For disclosure of HIV-positive status, many of the network-level social support variables were significant in the bivariate analyses but not in the multivariate model. This finding is likely due, in part, to the correlations among these social support variables. In the bivariate analyses, conflictual relationship was associated with disclosure of HIV status; however, this association was not significant in the multivariate analyses, which suggests that conflictual relationships are often with the same network members who provide positive social support. There was a positive association between the age of the network member and the participants' disclosure of their HIV-positive serostatus to that network member. This association may be due to older network members having more resources to provide support or an artifact based on the duration of time that the dyad knew each other. We hypothesized that participants would be less likely to disclose their HIV status to sexual partners as compared to other network members. In contrast to Rice et al. 's [19] network study of women, we found that participants were less likely to disclose HIV-positive status to male sexual partners as compared to female network members who were not sexual partners. Yet there was no statistical association between disclosure of HIV status to female sexual partners as compared to female network members who were not sex partners. The study findings are consistent with prior research that suggest that many sexual partners are not informed about their partners' HIV seropositive status and suggest the need for interventions that promote the norms of disclosure and acceptance of HIV positivity within the community. Most HIV-positive participants reported that they had disclosed their serostatus to several social network members. As there is a need for both emotional and material social support for optimizing HIV medical care and HIV medication adherence [27], these findings

suggest that it may be valuable to train network members who are aware of MSM's HIV status and same-sex behavior to provide emotional support and physical assistance with HIV medical care.

In general, the magnitude of the statistical associations with network characteristics was stronger for the outcome of disclosure of HIV-positive status as compared to disclosure of MSM behavior and a larger proportion of network members were aware of Indexes' MSM behavior as compared to their HIV-positive serostatus. These differences may indicate greater selectivity in disclosure patterns of HIV serostatus. Alternatively, greater duration of time as an MSM as compared to being HIV-positive may have provided more opportunities for disclosure.

The study was limited by self-report and sampling biases, such as high levels of unemployment, as well as a cross-sectional study design. Although the study eligibility requirement of reporting high risk behaviors may have influenced the HIV rates, these rates are highly similar to what has been reported in the Baltimore behavioral surveillance study of 51.4% (2004-2005) and 44.7% (2008) among Black MSM [28]. Given the cross-sectional study design, we do not know if participants' social networks were altered as a result of disclosure or to prevent disclosure. Disclosure may have strengthened some relationships and weakened or broken others. An additional limitation was that the survey questions on MSM and seropositivity disclosure were not phrased exactly the same. We also do not know if social network members would have concordant reports about knowledge of participants' same-sex behaviors and HIV serostatus. Moreover, we did not examine the nuances of the disclosure process.

MSM and seropositivity disclosure are not necessarily independent events; the reaction to their disclosure of HIV or MSM may have influenced participants' decision to disclose other information. Moreover, the disclosure of HIV status may lead to inquiries on the mode of acquisition. Only 2% of network members were perceived to treat the Indexes poorly because they knew about their same-sex behaviors. However, we do not know when the disclosure occurred and whether attitudes about MSM behaviors have changed over time.

It is important not to view disclosure of serostatus and MSM behavior as universally proscriptive. The majority of this sample was unemployed and earning less than $10,000 per year. Some participants may be dependent on family and friends for financial, housing, and other sources of material support. Consequently, it may be beneficial to help individuals delineate both their social networks and support needs, and how to make strategic decisions about disclosing same-sex behaviors and HIV serostatus. Moreover, given the rates of HIV in this sample, programs for prevention for HIV-positives among African American MSM are clearly needed.

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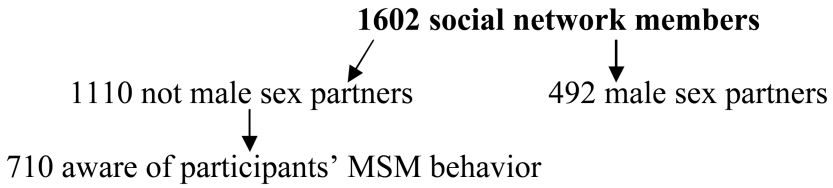

Figure 1. Breakdown of types of 3/10/2011social network members

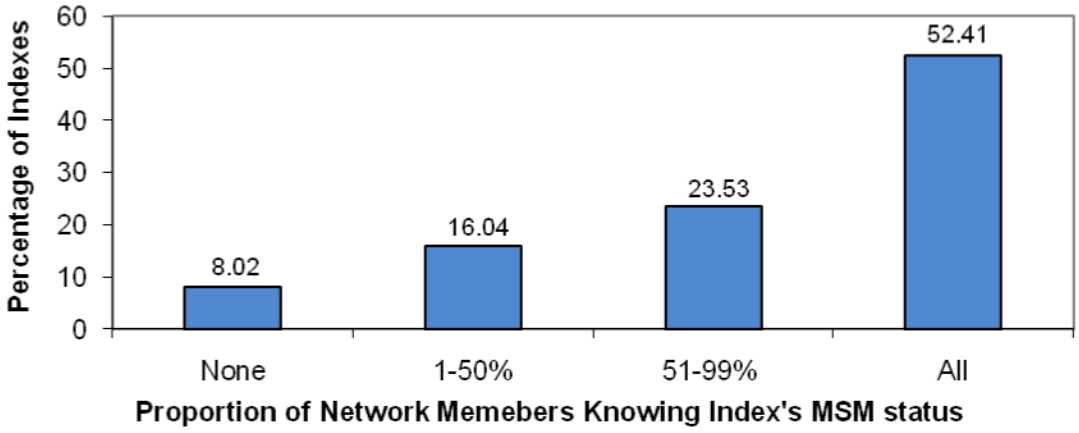

Figure 2. Percentages of social network members who are aware that the Index participant has sex with men, as reported by Index, in the UND Study, Baltimore, Maryland (2006-2009)

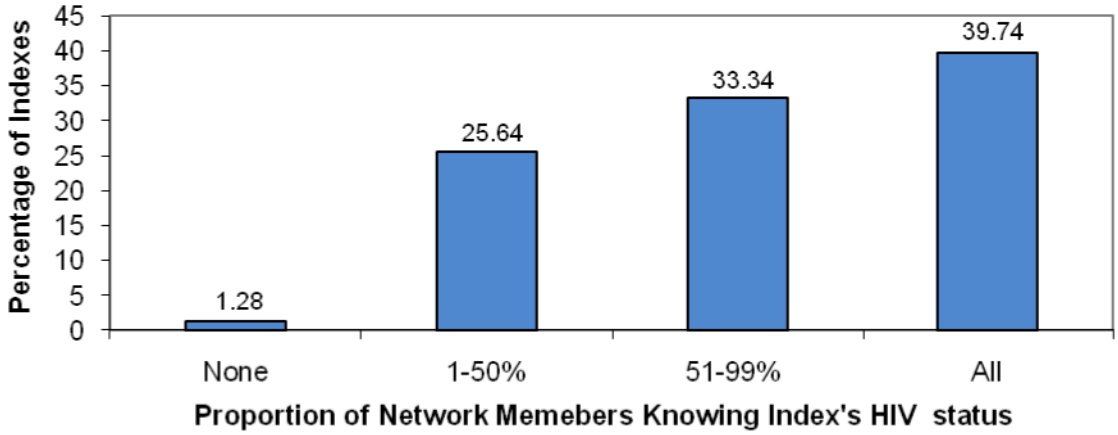

Figure 3.
Percentage of social network members whom participants report are aware of their HIV seropositive status among HIV-positive study participants, as reported by Index, in the UND Study, Baltimore, Maryland (2006-2009).

Table 1

Baseline characteristics of men (n=187), in the UND Study, Baltimore, Maryland (2006-2009)

Characteristics	N	Frequency (%)
Self considered sexual identity		
Homosexual, gay or same gender loving	105	56.2
Bisexual	63	33.7
Heterosexual or straight	13	7.0
Queer	1	0.5
Other or not sure	5	2.6
Mean age: (SD)	38 (10.41)	
Education		
Less than college	108	57.8
Some college, Associate's degree or higher	79	42.2
Employment		
Not working or on disability	136	72.7
Working part/full-time	51	27.3
Last year personal income		
<$10,000	101	54.0
>=$10,000	86	46.0
Self reported HIV status		
Negative	109	58.3
Positive	78	41.7
HIV status by oraquick or document by client		
Negative	94	50.3
Positive	93	49.7
Mean network size: (SD)	9 (4.33)	

Table 2

The Results of GEE Logistic Regression Model of MSM status disclosure and HIV-positive status disclosure using network member as unit of analysis

	MSM status disclosure(N=1,110)				HIV-positive status disclosure (N=635)			
Characteristics	**Unadjusted Odds Ratio**	**P value**	**Adjusted Odds Ratio**	**P value**	**Unadjusted Odds Ratio**	**P value**	**Adjusted Odds Ratio**	**P value**
Index								
Age (standardized)	0.50	<.001	0.39	<.001	0.77	0.15	0.60	0.006
Education (at least college, associates or technical degree)	2.43	.008	2.38	.02	1.39	0.33	---	---
Income (>=10,000)	1.65	.12	---	---	1.51	0.20	---	---
HIV-positive (Oraquick or documentation)	2.84	.001	4.67	<.001	---	---	---	---
Years since known HIV status	---	---	---	---	1.03	0.27	---	---
Network member								
Age (standardized)	0.97	.70	---	---	1.49	0.01	1.42	.03
Relationship (reference: female non sex partners)								
Female sex partners	0.14	<.001	0.19	<.001	1.32	0.71	1.22	.80
Male non sex partners	0.91	.51	0.71	.05	0.68	0.14	0.70	.07
Male sex partners	---	---	---	---	0.33	<0.001	0.32	<.001
Living distance (reference: outside the neighborhood)								
Same neighborhood (within five blocks)	0.90	.73	---	---	0.63	0.33	---	---
Same household	0.64	.03	---	---	1.03	0.94	---	---
HIV-positive	2.14	.02	2.05	.03	3.97	<.001	6.39	<.001
Provides emotional support	2.18	<.001	2.17	<.001	3.60	<.001	1.90	.03
Provides material support	1.49	.02	---	---	3.00	<.001	---	---
Loaned Index money	1.28	.172	---	---	2.23	0.007	2.89	.04
Entrusted by Index with money	1.20	.45	---	---	5.15	0.002	---	---
Socializing with	2.03	<.001	1.71	.005	2.08	0.002	---	---
Seen at least weekly	1.26	.23	---	---	1.52	0.12	---	---
High level of trust	1.14	.51	---	---	2.86	<.001	---	---
Conflictual relationship	0.99	.99	---	---	2.23	0.03	---	---
Had conversation about HIV/STD prevention	2.20	0.02	---	---	3.45	0.03	2.81	.07

Total sample reported 1,602 network members, 1,110 of which were non-male sex partners; HIV-positives (n=78) reported 635 network members